ND GIS Users Conference

Hazus- MH

Mitigation Planning & Community Development

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FEMA

Outline

- INTRODUCTION
- HAZUS-MH METHODOLOGY
- MITIGATION PLANNING
- BENEFIT – COST ANALYSIS
- HAZUS-MH
- HAZUS-MH & HAZARDS

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HAZUS-MH: GIS Technology

- HAZUS since 1997

Arc Desktop 7.1

Cameo – Identify chemicals & properties

Aloha – Dispersal model

Landview – Demographics

Marplot – search engine from TierII data

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HAZUS-MH: FEMA'S SOFTWARE PROGRAM FOR ESTIMATING POTENTIAL LOSSES FROM DISASTERS

HAZUS-MH Components

- Identify Hazard
- Model Inventory
- Quantify Impact

comprehensive risk assessment by integrating information of hazards with inventory information

Risk Assessment

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HAZUS-MH Inventory

Building Inventory • Demographic Data • Exposure (# & $) • Agriculture • Buildings	***Utility*** • Water • Oil and Gas • Electric Power • Communication
Transportation • Highway Systems • Railway Systems • Ports & Harbors • Airport Facilities	***Critical Facilities*** • Schools • Hospitals • Police & Fire Stations • Dams

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Mitigation Planning Benefit - Cost Analysis

It's a comparison of

***Before* mitigation conditions**

to the

***After* mitigation conditions.**

If damages are reduced after mitigation is implemented, then there are benefits to count.

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Chemical Hazards

CAMEO:

- Chemical Library to identify chemical and properties
- Notify special response resources
- Located plot plans, facility layouts, and chemical inventories

ALOHA: Dispersion model

- Determine initial isolation zones

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Benefit Cost Analysis

If the benefits are greater than costs, the project is cost-effective.

Some things are more cost-effective than others.

The benefit-cost ratio (BCR) is used to compare cost-effectiveness.

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Benefit Cost Analysis

Benefits are more difficult to determine than costs.

Benefits happen in the future and must be calculated probabilistically (statistically).

Project costs are easier to determine because they occur up front and are determined by cost estimates for each project.

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The Concept of Risk

"Risk" is a simple term for the monetary value of future damages.

"Value" means that future damages are always expressed in terms of money.

"Risk" is the single most important concept in mitigation planning and Benefit – Cost Analysis (BCA).

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The Concept of Risk

Risk equation :

Hazard and Risk

Probability of Damaging HAZARDS

Value and Vulnerability of Property Exposed to Hazard

Severity of Threat to the Built Environment

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HAZUS-MH Impact Assessment

Hazard

EQ
Flood
Wind
WMD

Inventory

Building Stock
Critical Facilities
Transportation
Utility
Demographics

Vulnerability

Building Stock
Schools
Hospitals
Transportation
Vulnerability
Utility
Police Stations
Fire Stations
EOC

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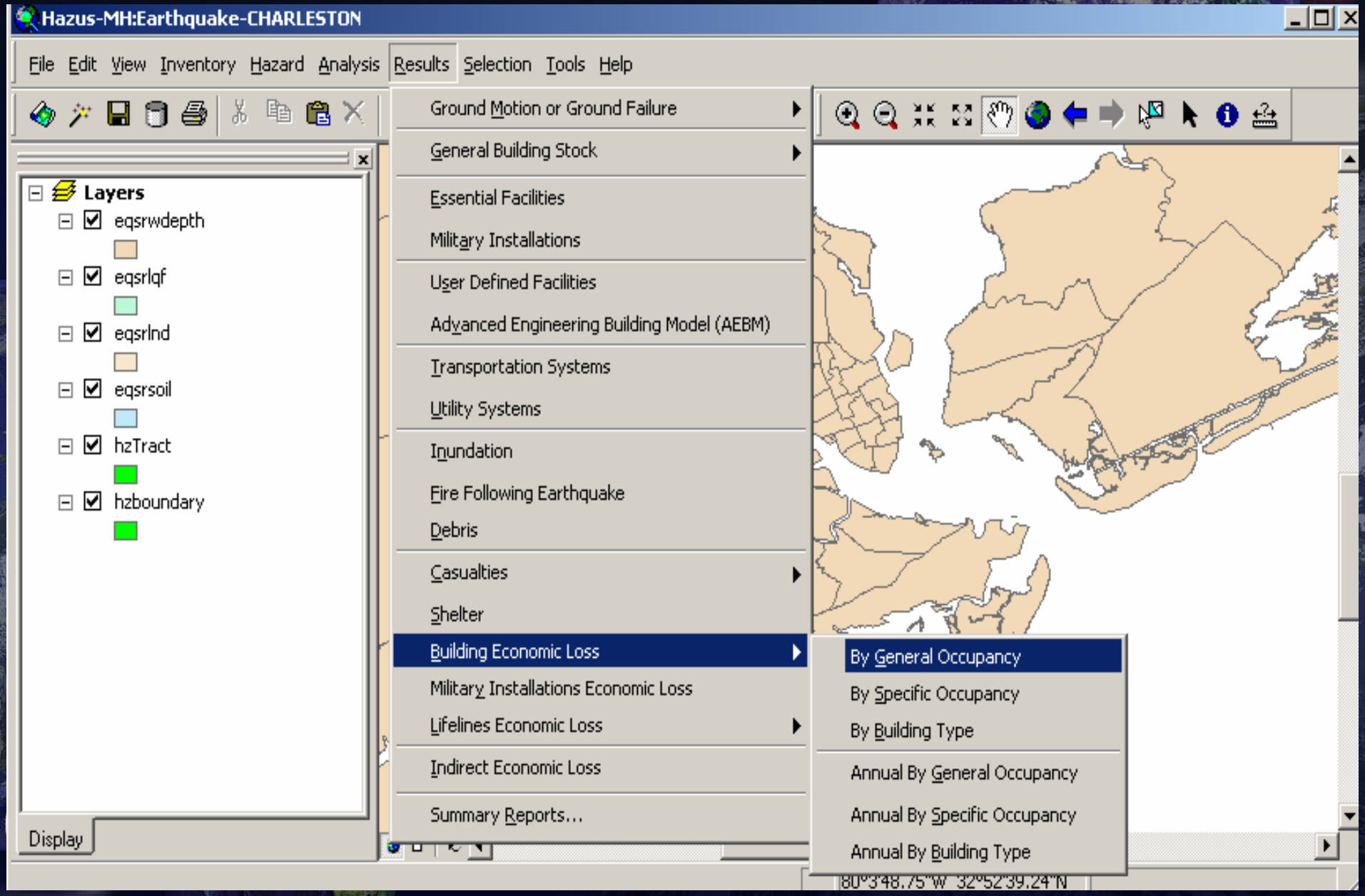
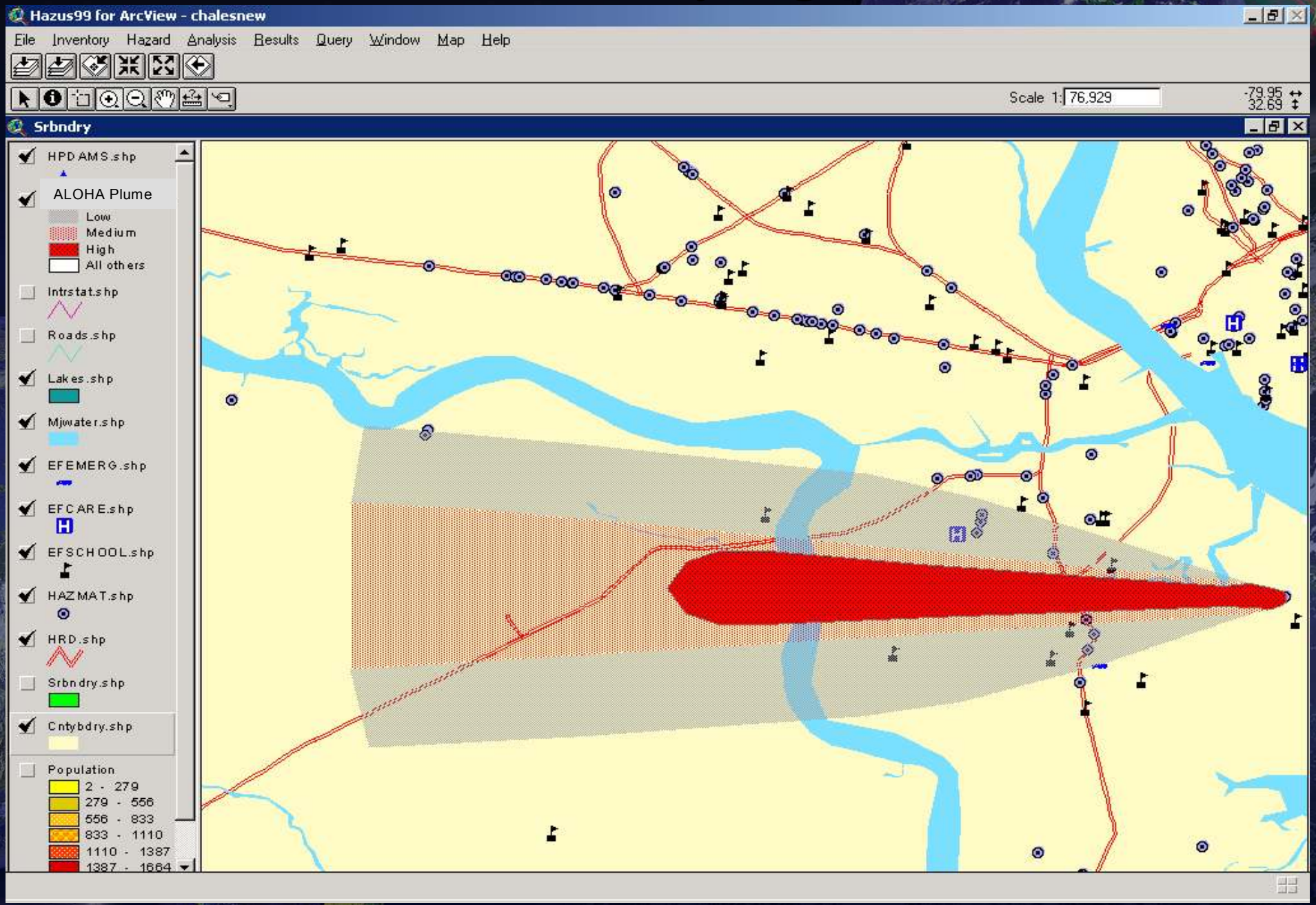
HAZUS-MH Results Menu



HAZUS-MH: FEMA'S SOFTWARE PROGRAM FOR ESTIMATING POTENTIAL LOSSES FROM DISASTERS

ALOHA Plume Overlaying HAZUS-MH



HAZUS-MH: FEMA'S SOFTWARE PROGRAM FOR ESTIMATING POTENTIAL LOSSES FROM DISASTERS

- **IDENTIFY** vulnerable areas that may require planning considerations (e.g., land use or building code requirements)
- **ASSESS** the level of readiness and preparedness to deal with a disaster before the disaster occurs
- **ESTIMATE** potential losses from specific hazard events, including pre-event, near real-time, and post-event report capability
- **DECIDE** on how to allocate resources for the most effective and efficient response and recovery
- **PRIORITIZE** the mitigation measures that need to be implemented to reduce future losses

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HAZUS-MH

Federal, State, and Local governments
use HAZUS
for pre-disaster Preparedness and Mitigation
and
post-disaster Planning & Response

1997

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HAZUS-MH: FEMA'S SOFTWARE PROGRAM FOR ESTIMATING POTENTIAL LOSSES FROM DISASTERS

HAZUS-MH and Risk Management

Prepare

Physical Impacts

Mitigate **Economic Impacts** Recover

Social Impacts

Respond

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Identify Hazards

Hazard regulation & control measures.

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